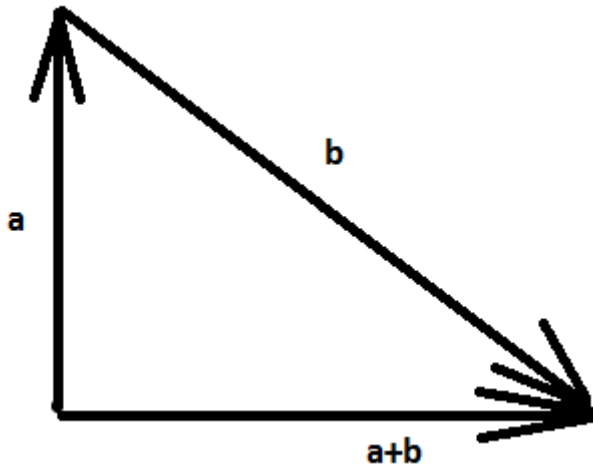


**Answer on Question #46802, Physics, Other**

Find the magnitude of  $a$  and the direction of  $b$  if  $a$  to the North,  $b$  has a magnitude of  $15m$ , and the resultant  $a+b$  is  $10m$  and due East



Using Pythagorean theorem

$$|b|^2 = |a|^2 + |a + b|^2 \rightarrow |a| = \sqrt{|b|^2 - |a + b|^2} = \sqrt{|15m|^2 - |10m|^2} = 5\sqrt{5}m \approx 11m$$

Now we can find direction of  $b$ :

$$\sin \alpha = \frac{|a + b|}{|b|} \rightarrow \alpha = \arcsin\left(\frac{10m}{15m}\right) \approx 42^\circ$$

**Answer:** magnitude of  $a \approx 11m$

direction of  $b$  -  $\approx 42^\circ$  East of south